



DOCKET NO: 249040US2S DIV

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
FUMITOMO MATSUOKA : EXAMINER: LEE, E.
SERIAL NO: 10/779,661 :
FILED: FEBRUARY 18, 2004 : GROUP ART UNIT: 2815
FOR: SEMICONDUCTOR DEVICE AND :
A METHOD FOR
MANUFACTURING THE SAME

REPLY BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

The present Reply Brief is submitted in response to the Examiner's Answer (hereinafter "EA") mailed June 4, 2007, in order to point out and respond to numerous errors in the EA as to clearly improper reliance on proportions of elements shown in FIG. 12B of Xiang.

REPLY ARGUMENT

A. The rejection of Claim 14,15, 17, and 18 under 35 U.S.C. §102(e) as being anticipated by Xiang

As noted on page 5 of the MB, the outstanding final Action (hereinafter "FA") fails to contain an "express statement of how the showings of FIG. 12B are relied upon to teach the limitation of Claim 14 requiring there to be 'tip portion opposite to the second impurity diffusion layer' and 'a tip portion opposite to the first impurity diffusion layer,' with both

these tip portions being overlapped by the gate electrode conductive layer without any overlap by the respective first and second impurity diffusion layers.”

In response to this observed lack of explanation, the EA (at page 5) now confirms appellant's assumption in the MB that the rejection of Claims 14, 15, 17, and 18 under 35 U.S.C. §102(e) as being anticipated by Xiang is based on the showing of FIG. 12B as to the extreme ends of the portions of drain 154 and source 156 that are labeled by the hand written notations “3rd” and “tip portions” in the reproductions of FIG. 12B on pages 4 and 5 of the EA. Thus, the Examiner has left no doubt that the rejection relies on interpreting FIG. 12 to accurately and precisely show an intentional overlap of the gate electrode relative to these “tip portions.”

As pointed out at pages 5-7 of the MB, the error in this approach is that it presumes that each of the source/drain (154/156) regions the Examiner has labeled as 3rd and 4th are drawn to at least the same horizontal scale as the layers 204, 168, 224, 225, and 234, 254. However, nothing is stated by Xiang as to using such a common horizontal scale and nothing is suggested as a purpose for spacers 168 other than the purpose well understood by those of ordinary skill in the art as to the use of spacers 168 to form lightly doped shallow portions (labeled 3rd in the FIG. 12B reproduction by the Examiner) that are less deep than the main source/drain regions (labeled 4th in the FIG. 12B reproduction by the Examiner).

As further noted at page 6 of the MB and completely ignored by the EA, there is no disclosure by Xiang even suggesting that there is any reason to believe that there is any common scale (horizontal, vertical, or otherwise) being used in any Figure. This was emphasized by pointing to the actual statement in Xiang (at col. 4, lines 46-47) that “[t]he figures referred to herein are drawn for clarity of illustration and are not necessarily drawn to scale” (emphasis added). Clearly, presumptions made that the relative proportion of regions 154, 156 has a specific positional and size relationship to any part of spacers 168 and/or gate

layers 252, 254, is contrary to this disclaimer that “[t]he figures referred to herein are drawn for clarity of illustration and are not necessarily drawn to scale” (emphasis added).

As further noted on page 6 of the MB, *Hockerson-Halberstadt, Inc. v. Avia Group. Int'l, Inc.*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) is a case that establishes it to be erroneous to rely on a drawing illustration of the relative proportions of illustrated elements when the disclosure is devoid of any indication that the proportions of these elements are drawn to scale as follows:

The ‘792 patent is devoid of any indication that the proportions of the groove and fins are drawn to scale. HHI's argument thus hinges on an inference drawn from certain figures about the quantitative relationship between the respective widths of the groove and fins. Under our precedent, however, it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue. See *In re Wright*, 569 F.2d 1124, 1127, 193 USPQ 332, 335 (CCPA 1977) (“Absent any written description in the specification of quantitative values, arguments based on measurement of a drawing are of little value.”); *In re Olson*, 212 F.2d 590, 592, 101 USPQ 401, 402 (CCPA 1954); cf. Manual of Patent Examining Procedure Section 2125 (1998).

In re Wilson, 312 F.2d 449, 454, 136 USPQ188, 192, (CCPA 1963) was also noted in the paragraph bridging pages 6 and 7 of the MB as also being relevant as to specifically pointing out that because “[p]atent drawings are not working drawings,” arguments predicated on portions of drawings “obviously never intended to show the dimensions of anything,” like the reliance on the proportions of the labeled “tip portions” relative to the proportions of the rest of the diffusion regions 154, 156, the proportions of the gate layers 234, 254, and the proportions of spacers 168 of FIG. 12B of Xiang are without merit.

Nevertheless, page 5 of the EA offers the completely subjective conclusion that “[t]here is no other conclusion that an ordinary artisan can make other than that the gate electrode overlaps the tip portions.” Missing from this unsupported subjective conclusion and the clearly erroneous presumption that this “is indisputedly disclosed by the reference” is

an understanding of the above-noted court established rule that assumptions based on the sizes of reference elements relative to one another are meaningless if those elements have not all been drawn to the same scale. If the scale is not the same as between illustrated elements than any illustrated overlap of these elements teaches nothing contrary to the spin attempted in the bottom two lines of page 5 of the EA that an illustrated overlap of two different elements can somehow be presumed to be an intentional teaching and not an accidental result of these elements not being drawn in the same scale.

The further suggestion at the top of page 6 of the EA that the artisan would "make the device in exactly the same way as it is structurally shown in FIG. 12 of Xiang" is further clearly an unsupported subjective conclusion lacking any support. For example, where is the Examiner's explanation of how the relied upon "tip portions" can be formed at the ends of the diffusion regions 154, 156, so as to lie under a middle part of the spacers 168 as clearly illustrated by the relied upon FIG. 12B of Xiang?

In this regard and as noted in the paragraph bridging pages 7 and 8 of the MB, there is no teaching in Xiang as to any method to use to form the reduced depth parts of source/drain regions 154, 156 in a manner to insure that they will be overlapped by the gate electrode conductive layer. Also, there is no disclosure of any purpose for spacers 168 of Xiang (120 in the "A" Figures). Furthermore, there is no teaching in Xiang as to any method to use to form the reduced depth parts of source/drain regions 154, 156 being called the "tip portions" so that they begin directly under the mid points of the spacers 168 that overlap these beginning parts.

As further noted in this paragraph of the MB, the only reasonable explanation for the presence of spacers 168 of Xiang (120 in the "A" Figures) is that they exist for the purpose of forming the shallow protruding "tip portions" of the source and drain regions beneath these sidewalls in the same manner as in background art FIGS. 1-8 of the present Application and

the showings of FIGS. 1-10 of Gardner et al. (U.S. Patent No. 6,200,865, of record), for example. Note again FIGS. 1-3 of Gardner et al. and background art FIGS. 1-2 of the present Application in particular as to the standard formation of shallow first diffusion regions without the presence of spacers, like 168 of Xiang, followed by adding spacers to mask parts of these shallow first diffusion regions. After forming the spacers as masks, deeper second diffusion regions are formed as to portions of the shallow first diffusion regions that are not masked by the spacers. This process (illustrated by both FIGS. 1-3 of Gardner et al. and background art FIGS. 1-2 of the present Application) results in the spacers being directly over and aligned with the edges of the lightly doped regions, not the exaggeration of all the Figures of Xiang in which no alignment between the edges spacers 168 (and 120 of the "A" Figures) and the edges of the shallow diffusion regions can be seen.

It is interesting to note that the bottom of page 6 of the EA dismisses the evidence relied on to show the only known use of spacers like 168 of Xiang as being conjectural with a preference for them being elements completely lacking any purpose. The simple question unanswered by the Examiner is how the beginning of the "tip portions" of FIG. 12B can be made to be under the middle of the completely useless spacers 168 that FIG. 12B illustrates. If the overlap of these "tip portions" must be taken as intended disclosure, then the overlap of the start of the "tip portions" by the mid section of the useless spacers 168 must also be intentional and the Examiner must explain how it was done.

Just as the EA suggests that the only known use for spacer 168 is a mere matter of conjecture that cannot stand against the subjective conclusion that the illustrated spacers 168 have no purpose, page 7 of the EA then subjectively concludes that even though there is no disclosed purpose for spacer 168, the disclosure of FIG. 12B is not ambiguous.

As noted in the paragraph bridging pages 8 and 9 of the MB, however, the drawings of Xiang are clearly ambiguous as to the exact relative placement of the "B" Figure showings

of spacers 168 (120 in the "A" Figures) and the final conductive gate layers 234, 254 (232, 252 in the "A" Figures) lying over the shallow lightly doped parts of the source 156 (106 in the "A" Figures) and drain 154 (104 in the "A" Figures) impurity diffusion layers. As further noted at this part of the MB, "[i]t is well established that such ambiguous showings subject to different interpretations cannot be relied upon to establish anticipation. See, *In re Turlay*, 304 F.2d 893, 899, 134 USPQ 355, 360 (CCPA 1962). Also note the requirement that references provide clear and definite disclosures as to the features therein that are being relied upon. See *In re Hughes*, 345 F.2d 184, 188, 145 USPQ 467, 471 (CCPA 1965) and *In re Moreton*, 288 F.2d 708, 711, 129 USPQ 227, 230 (CCPA 1961)."

The only response in the EA is that notwithstanding the complete lack of purpose for spacers 168, the disclosure of FIG 12B is unambiguous because it shows the gate overlaps the "tip portions" and all else is apparently dismissed as meaningless.

The position of the EA is little more than a denial of the requirement that the PTO must supply evidence and a rational explanation as set forth by the Court in *In re Lee*, 277 F.3d 1338, 1342, 61 USPQ2d 1430, 1432-33 (Fed. Cir. 2002) as follows:

... the agency tribunal must present a full and reasoned explanation of its decision. The agency tribunal must set forth its findings and the grounds thereof, as supported by the agency record, and explain its application of the law to the found facts.

CONCLUSION

Applicant again respectfully submits that the artisan would understand that FIGS 1-12 of Xiang are not intended to show the actual positions of the Xiang shallow source (106, 156) or shallow drain (104,154) lightly doped portions relative to either the spacers (120 or 168) or the final conductive gate electrodes 232, 252 or 234, 254. Further, Applicant again respectfully submits that if these shallow lightly doped portions of the source (106, 156) and drain (104, 154) impurity diffusion layers were accurately depicted as to their exact locations

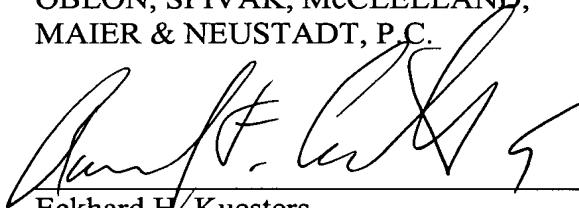
Application No. 10/779,661

Reply to Examiner's Answer mailed 06/04/2007

relative to these spacers used to form them in the conventional manner, the showing would match the aligned background art FIG. 8 of this Application and the similar aligned showing of FIG. 3 of Gardner, for example, and would be subject to the problem that the present invention seeks to overcome and that is not recognized or discussed by Xiang. Thus, reversal of the outstanding rejection of Claims 14, 15, 17, and 18 under 35 U.S.C. §102(e) as being anticipated by Xiang is again respectfully requested.

Respectfully Submitted,

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